DEC STD 074-15 Printer Systems Standard - Text Ruling Vector Functions

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ABSTRACT: This section of DEC STD 074 describes the DECVEC (absolute) and DECRVEC (relative) text-ruling, vector-control functions for use in Digital printer software.

APPLICABILITY: The requirements of this document are mandatory for Engineers designing hardware for terminal products and Software engineers designing programs using terminal interfaces.

STATUS: APPROVED 31-Aug-1990; use VTX SMC for current status.

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1 INTRODUCTION

This section of the Printer Systems Reference Manual defines the parameters of text ruling vector functions for use in software that interfaces with Digital Printers. Text ruling vector functions are an extension to Level 3 of Digital's printer architecture.

Absolute vectors (DECVEC) are used primarily for drawing boxes (rectangles) around text or to frame a page by drawing a box around the page normally outside the margins. Relative vectors (DECRVEC) are used primarily to allow formatting software to place text anywhere on a page, specifying vectors relative to the text. The text ruling vector commands are an extension to Level 3 of the printer architecture.

2 FUNCTIONAL DESCRIPTION

Vectors are only allowed to draw within the printable area of a page. If a vector extends beyond the printable area in any direction, it will be clipped and shall NOT autowrap. Vectors only draw lines that are parallel to one of the coordinate axes (See *DEC STD 074-6 Printer Systems Standard - Page Coordinate System*). The active position is NOT changed by any vector command. The First Character Flag is NOT checked when processing any vector command.

3 CONTROL FUNCTIONS

3.1 DRAW VECTOR - DECVEC

Draw a horizontal or vertical line of specified length and width at a specified position.

FORMAT

```
CSI  Ps1   ;   Pn2 ;    Pn3 ;    Pn4 ;    Pn5 !   |
9/11 3/? 3/11  3/? 3/11 3/? 3/11 3/? 3/11 3/? 2/1 7/12
```

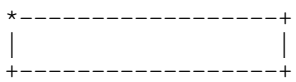
DESCRIPTION

DECVEC draws either horizontal or vertical lines. (Lines that are not parallel to one of the coordinate axes cannot be drawn.)

DECVEC is allowed to draw lines that extend beyond the margins without causing Autowrap.

The length, width, and direction of the line are determined from the parameters contained in the sequence. The units in which those parameters are interpreted depend upon the setting of SSU (Set Size Unit) only, regardless of the setting of PUM (Position Unit Mode).

A vector has length and width and can be considered a filled rectangle rather than a line. Said rectangle always has its upper left-hand corner on the starting point.



The '*' in the above example shows where the starting point is located.

Line parameters are interpreted in the following manner.

Table 1: DECVEC (Draw Vector) Parameters

Param	Effect
Ps1	0 - X line drawn horizontal with respect to the intended page orientation and in the direction of character progression. 1 - Y line drawn vertical with respect to the intended page orientation and in the direction of line progression. Any other value: Perform no action.
Pn2	x coordinate of start position.
Pn3	y coordinate of start position.
Pn4	Line length. If after converting to pixel units, the requested length is less than 1 pixel, a 1-pixel long line will be drawn.
Pn5	Line width. If after converting to pixel units, the requested width is less than 1 pixel, a 1-pixel wide line will be drawn.

ERROR HANDLING

If the requested vector extends beyond the physical limits of the page, only that portion of the line that occurs within the page is printed.

DEFAULT

The default value of all parameters is 0.

3.2 DRAW RELATIVE VECTOR - DECRVEC

Draw a horizontal or vertical line of specified length and width relative to the active position.

FORMAT

```
CSI Ps1 ; Pn2 ;   Pn3  SP  |
9/11 3/? 3/11 3/? 3/11 3/? 2/0 7/12
```

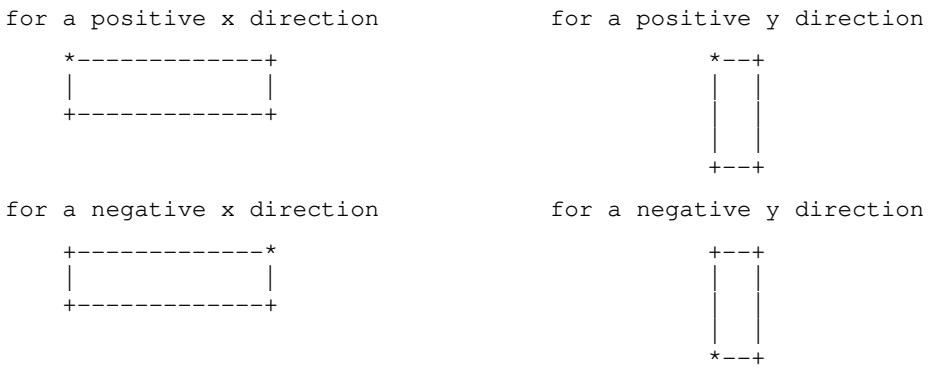
DESCRIPTION

This sequence causes the printer to draw a horizontal or a vertical line from the active position.

DECRVEC may draw lines that extend beyond the margins without causing Autowrap.

The length, width, and direction of the line are determined from the parameters contained in the sequence. The units in which those parameters are interpreted depend upon the setting of SSU only, regardless of the setting of PUM.

A relative vector has length and width and can be considered a filled rectangle rather than a line. Said rectangle always has a corner on the starting point. Horizontal lines, in either direction, are thickened in the positive Y direction. Vertical lines, in either direction, are thickened in the positive X direction. This is illustrated in the following examples.



The '*' in the above examples show where the starting point is located. This point is also the active position.

Line parameters are interpreted in the following manner.

Table 2: DECRVEC (Draw Relative Vector) Parameters

Param	Effect
Ps1	0 - X line drawn horizontal with respect to the intended page orientation and in the direction of character progression (default). 1 - Y line drawn vertical with respect to the intended page orientation and in the direction of line progression. 2 - X line drawn horizontal with respect to the intended page orientation and opposite to the direction of character progression. 3 - Y line drawn vertical with respect to the intended page orientation and opposite to the direction of line progression.
Pn2	Line length. If after converting to pixel units, the requested length is less than 1 pixel, a 1-pixel long line will be drawn.
Pn3	Line width. If after converting to pixel units, the requested width is less than 1 pixel, a 1-pixel wide line will be drawn.

ERROR HANDLING

If the requested line extends beyond the physical limits of the page, only that portion of the line which occurs within the page is printed.

DEFAULT

The default value of all Parameters is 0.

SOFTWARE IMPLEMENTATION NOTE

The DECVEC command is unique in that it causes drawing on the page but it neither uses nor affects the active position. If DECVECs are interspersed with commands that do change the active position, it may be hard to detect certain error conditions. A succession of embedded line feeds, for example, may move the active position off the bottom of the page, but not affect where vectors are drawn until the page is advanced.

APPENDIX A REFERENCED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00074-06	*DEC STD 074-6 Printer Systems Standard - Page Coordinate System*

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